

Claims

1. A networked image data processing environment, comprising
a plurality of image data processing systems;

5 a plurality of data storage systems, wherein each of said data storage
systems is operated under the direct control of one of said image processing
systems;

a high bandwidth switching means connected to each of said data
processing systems;

10 a low bandwidth network connecting said image processing systems
and to said switching means, by which one of said processing systems
controls the operation of said switching means, and in which

a first processing system requests access to a data storage system
controlled by a second processing system over said low bandwidth network;

15 said second processing system makes an identification of storage
regions that may be accessed by said first processing system and to each of
said storage systems;

said second processing system conveys said identification to said first
processing system over said low bandwidth network; and

20 said first processing system accesses said identified storage portion
via said high bandwidth switching means.

2. A processing environment according to claim 1, wherein said
data processing systems are based around a silicon graphics O₂, Octane or
25 Onyx2 computer.

3. A data processing environment according to claim 1, wherein

said data storage systems include a plurality of disks configured to receive image stripes.

4. A data processing environment according to claim 3, including
5 redundant disks to provide data security.

5. A data processing environment according to claim 4, wherein
said disks are configured as a redundant array of inexpensive disks (RAID).

10 6. A data processing environment according to claim 1, wherein
said high bandwidth switching means is a fibre channel switch.

7. A data processing environment according to claim 1, wherein
said low bandwidth network is an Ethernet network.

15 8. A data processing environment according to claim 1, wherein
said processing systems execute programs to identify requests made by
other processing systems.

20 9. A data processing environment according to claim 1, wherein at
least one image data processing system has direct control of a plurality of
data storage systems.

25 10. A data processing environment according to claim 9, including
lower powered data processing systems that are configured to supply image
data to image data processing systems connected to said high bandwidth
switching means.

11. A method of transferring data in a networked image data processing environment, including a plurality of image data processing systems, a plurality of data storage systems, a high bandwidth switching means connected to each of said data processing systems and to each of
5 said storage systems, and a low bandwidth network connected to said image processing systems and to said switching means, by which one of said processing systems controls the operation of said switching means, wherein said method performs the steps of:

10 operating each of said data storage systems under the direct control of one of said image processing systems;

issuing a request from a first processing system to access a data storage system controlled by said second processing system over said low bandwidth network;

15 making an identification at said second processing system of storage regions that may be accessed by said first processing system;

conveying said identification from said second processing system to said first processing system over said low bandwidth network; and

20 accessing said identified storage portion by said first processing system via said high bandwidth switching means.

12. A method according to claim 11, wherein said data processing systems are based upon a Silicon Graphics O₂, Octane or Onyx2 computer.

25 13. A data processing environment according to claim 11, wherein said data storage system includes a plurality of disks configured to receive image stripes.

14. A method according to claim **13**, including redundant disks to provide data security.

5 **15.** A method according to claim **14**, wherein said processing systems are configured to write data to said array of disks and read data from said array of disks using RAID protocols.

10 **16.** A method according to claim **11**, wherein said high bandwidth switching means is a fibre channel switch.

15 **17.** A method according to claim **11**, wherein said low bandwidth network is an Ethernet network.

20 **18.** A method according to claim **11**, wherein said processing systems execute programs to identify requests made by other processing systems.

25 **19.** A method according to claim **11**, wherein at least one image processing system has direct control of a plurality of data storage systems.

20. A method according to claim **19**, including lower powered data processing systems that are configured to supply image data to image data processing systems connected to said high bandwidth switching means.

21. A computer-readable medium having computer-readable instructions executable by a computer such that, when executing said

instructions, a computer will perform the steps of

- directly controlling a local disk storage system;
- issuing a request to access a data storage system controlled by a second processing system over a low bandwidth network;
- 5 receiving an indication from said remote processing system identifying storage locations that may be accessed on said second storage system;
- accessing said data portions through a high bandwidth switching means connected to each of said processing systems and to each of said storage systems.

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22. A computer-readable medium having computer-readable instructions according to claim **21**, such that when executing said instructions a computer will perform RAID calculations when writing data to a locally controlled disk and when reading data from said locally controlled disk.

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23. A computer-readable medium having computer-readable instructions according to claim **21**, such that when executing said instructions a computer will issue said requests over an Ethernet network.

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24. A computer-readable medium having computer-readable instructions according to claim **23**, such that when executing said instructions a computer will receive said indication over said Ethernet network.

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25. A computer-readable medium having computer-readable instructions according to claim **21**, such that when executing said instructions a computer will access said indicated portions through a fibre channel switch.

26. A computer-readable medium having computer-readable instructions executable by a computer such that, when executing said instructions, a computer will perform the steps of

directly controlling a local disk storage system;

5 responding to a request from a remote data processing system to access said local disk storage system;

identify a portion of said local disk processing system that may be accessed by said remote processing system; and

10 issuing an indication to the effect that said remote processing system may gain access to said storage system via a high bandwidth switching means.

27. A computer-readable medium having computer-readable instructions according to claim **26**, such that when executing said instructions, a computer will respond to said requests received over a low
15 bandwidth Ethernet.

28. A computer-readable medium having computer-readable instructions according to claim **27**, such that when executing said instructions
20 a computer will issue said indication over said low bandwidth Ethernet.

29. A computer-readable medium having computer-readable instructions according to claim **26**, such that when executing said instructions a computer will perform RAID calculations while directly controlling said local
25 disk storage systems.

30. A computer-readable medium having computer-readable

